

Topics in Neurobiology and Behavior: Plasticity of the Nervous System

Instructor: Tina Kao, PhD

Instructor email: tk2436@columbia.edu

Course Overview: This seminar provides an overview of the mechanisms and behaviors associated with neural plasticity. Students will obtain a basic working knowledge of the different types of neural plasticity, and how these affect cognition and behaviors. Topics will vary weekly, and different scientific literature from different journal articles that are associated with the weekly topics will be interpreted and discussed. The topics to be addressed range from developmental, to structural, functional, and to injury and activity induced plasticity. The journal articles will encompass data collected from both human and non-human models. Upon successful completion of this seminar, students will be better able to evaluate and critique scientific literature. In addition, this course will prepare students to approach scientific questions with vigor and validity, and therefore, be better at objective, critical and analytical thinking.

Course Format: Basic background concepts of the very diverse fields of plasticity of the nervous system will be presented, and serve as the core knowledge associated with the weekly topics. For the weekly topics, reading assignments will consist of scientific literature from journals relevant for Psychology and Neuroscience. Readings will be made available through CourseWorks. Most of the classes will consist of a lecture overview of the relevant topic followed by presentations and discussions of the readings. A paper will be required. This paper will be written similar to that of a scientific review article. Students can choose their topic of interest (within neural plasticity) for the paper, and an oral presentation based on the paper will be required.

Course Requirements: See below

Weekly readings and postings of comments/questions/thoughts on the research article to be discussed (25%) - Each student is expected to read the assigned scientific articles for every class. By 5pm the day before each class (Thursday), each student is expected to post substantial comment(s), question(s), or thought(s) on the research article to be discussed during class the following day. Your postings will be seen by everyone, and available to view on the course's Discussion within CourseWorks. To access the weekly readings and postings, log onto CourseWorks --> choose this course --> click on the tab corresponding to the weekly readings and postings.

Presentation(s) of assigned research article (25%) - Each week, a student will present on the assigned research article. The presentation should consist of using visual aids such as slides, to lead the discussion of the assigned research article. Based on current enrollment, which may change, each student will give one presentation on an assigned research article during the semester.

Mini scientific review paper (30%) - Students will have gained familiarity of scientific review articles throughout the course because the assigned weekly readings will consist of a scientific review article, along with a scientific research article. Your paper should be written as a "mini scientific review", and can consist of any topic of your choosing that we have discussed during the semester. You are expected to

inform the professor of the topic you plan on writing about before submission. Your mini scientific review paper is expected to be between 8 – 12 pages.

Presentation of mini scientific review paper (10%) -Each student will be expected to give a presentation on the paper they have written. The presentation should elaborate on the topic you have chosen for your paper.

Class participation (10%) - students are expected to attend every class session and participate in discussions.